

Running head: EMOTION AND FALSE MEMORY

The Effects of Emotion on False Memory Production

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Abstract

This study seeks to investigate the effects of emotion on false memory production. 114 undergraduate college students participated in the study. Subjects were given an emotion induction task that induced positive, negative, or neutral moods by rating person descriptive words taken from the Dumas norms. Each subject was then asked to listen to lists of study words taken from the Deese-Roediger-McDermott paradigm and was then given an immediate recognition memory test. One week later, subjects were given a delayed recognition memory test to measure the degree of forgetting. Results indicate that on the immediate test, although there were no differences observed across emotion conditions for true memory, participants in the negative emotion condition were more prone to produce false memories than those in the positive or neutral conditions. In addition, there was no main effect of emotion for the immediate test, but there was one for the delayed memory test. It was found that acceptance rates of both targets and critical distractors decreased for participants in the negative emotion condition relative to positive and neutral conditions. It was also found that one could inoculate the effects of forgetting on a delayed memory test by giving subjects a prior memory test.

The Effects of Emotion on False Memory Production

Memory processes have interested researchers for decades and although several theories have emerged to explain the complexity of the mind, much remains unknown and under investigation. In particular, numerous theoretical explanations have been developed to explain false memory phenomena. In general, false memory refers to instances in which we possess definite memories of events that did not actually happen to us. Thus, false memories refer to errors of commission rather than omission. Although the study of false memory in normal, healthy subjects is a relatively new phenomenon, many studies of a related nature have been conducted throughout the history of psychology. For example, Piaget's early studies of constructive memory in children paved the way for modern research on age differences in susceptibility to false memory. In addition, Alfred Binet's interests in suggestive forms of questioning, as well as F.C. Bartlett's (1932) studies of repeated recall of narrative text, were consistent with modern research on false memories, particularly the effects of suggestive interviewing and interrogation. Both studies were conducted to explain errors in memory for complex narrative material and thus have important implications in the legal arena. Critical decisions made in court are often based heavily upon the ability of witnesses to accurately recall past events, and while witnesses are probed to tell the truth, they can only do so to the best of their errant experience.

Theories of False Memory

Early Theories

A key feature of false memory is that it is actually characteristic of normal every day occurrences, rather than being confined to abnormal psychology. The prevalence of false memories in both abnormal and normal psychology emphasizes the importance of understanding how and why they form. As a result, many theories have emerged to explain its occurrence.

One of the earliest theories of false memory was constructivism, which up-held the notion that people remember what they perceive to be the meaning of their experience and not necessarily the details of the experience itself (Bransford, Barclay, & Franks, 1972). Thus, based on the constructivism theory, people have a tendency to remember false information that preserves the gist of their experience. However, this explanation erroneously suggests that the interpretations of events are integrated into semantic structures (schemas), while the actual content of the experience (surface form) is immediately removed from memory. Studies since then have shown that memories of specific surface information may remain accessible for long periods of time (Hintzman, Block, & Inskip, 1973; Kolers, 1976).

In later years, schema theory evolved from constructivism, and up-held the notion that only some of the people, objects, and events specific to an experience will be encoded into memory and preserved based on the individual's current cognitive schemas. There are several limitations to this theory. For instance, there is an underlying assumption that people are capable of remembering only schema-consistent information. The theory fails to explain false memories that result from studying word lists, as there is no activation of memory schemas in such an experimental manipulation. Furthermore, there is a dependency between true and false memories because it is assumed that true and false memories of target presentation are generated by the same memory structure. As a result, this theory predicts a positive relationship between the levels of both true and false memories, which has been shown to be incorrect. As demonstrated by a 1994 study conducted by Reyna and Kiernan involving a series of short, three-sentence vignettes that activate well-established schemas, it was found that subjects' tendency to correctly recognize presented sentences was uncorrelated with their tendency to falsely recognize unpresented meaning-consistent sentences. In addition, it was found that age

differences between subjects drove true- and false-memory performance in opposite directions.

Another early explanation was the source-monitoring framework, in which false memories were viewed as incorrect attributions about sources of information or confusions about sources (Johnson, Hashtroudi, & Lindsay, 1993). Accordingly, false memories arise due to failures in accurately monitoring the origin of the information that produces the memories (Brainerd & Reyna, 2005). As a result, false memories have the partly-true and partly-false qualities of all reality-monitoring errors which arise from an inability to discriminate between true memories of actual external events from false memories of external events that were not actually experienced (Johnson & Raye, 1981). For example, in an eye-witness identification task, false reports are the result of confusion about the source of memories. These memories are true in the sense that they refer to events that are within the domain of one's experience, but they are false in the sense that the origins of the events (internal rather than external) have been misidentified (Brainerd & Reyna, 2005). Critics of this theory maintain that many false memories are the result of pure familiarity errors rather than source errors (Reyna, 2000; Reyna & Lloyd, 1997).

In the last decade of the 20th century, contemporary theories of false memory have evolved from the dual-process theories of true memory. These theories propose that recognition memory is based on two qualitatively and quantitatively distinct processes, referred to as recollection and familiarity. Although it is a relatively new phenomenon, its empirical observations can be traced back decades ago. Strong's (1913) findings on the role of memory in consumer product choice illustrated that there were two types of recognition: familiarity and recollection. Strong's participants performed a recognition test and introspected on their mental experiences during the task. From his studies, it was concluded that word recognition was accompanied by two distinct

versions of mental experience: one vague and global (familiarity) and the second clear and specific (recollection). Contemporary dual-process theories are founded on this distinction.

Fuzzy-Trace Theory

Fuzzy-trace theory (Brainerd & Reyna, 2005) extends this dual-process distinction to include false recognition and false recall. The theory posits that false-memory responses are affected by mechanisms that operate in opposition to each other. This idea stands in contrast to the assumption in dual-process theories of true memory that recollection (verbatim traces) and familiarity (gist traces) reinforce each other to support recognition of targets and that direct access (verbatim traces) and reconstruction (gist traces) reinforce each other to support recall of targets (Brainerd & Reyna, 2002). While verbatim and gist retrieval both support true memory for experienced items, verbatim and gist retrieval have opposite effects on false memory for items that preserve the meaning of experience. Gist retrieval facilitates false memories because items' meanings seem familiar, but verbatim retrieval suppresses false memory by neutralizing the meaning familiarity. According to fuzzy-trace theory, subjects process the surface form (verbatim) and meaning content (gist) of experience in parallel, storing dissociated representations of both traces. Verbatim traces are episodic representations of the surface forms of experienced items, and gist traces are episodic interpretations of concepts including meanings, relations, and patterns (Brainerd & Reyna, 2002). Another principle of fuzzy-trace theory is that there is dissociated retrieval of verbatim and gist traces. Concerning retrieval cues, items that are experienced are better retrieval cues for verbatim traces than items that are not, and non-experienced items that preserve the meaning of experience are usually better retrieval cues for gist traces than verbatim traces. A major difference between fuzzy-trace theory and the other theories is its notion of integration of verbatim traces. Other theories posit that the storage of

individual surface features may later be retrieved together, while fuzzy-trace theory assumes that verbatim traces are integrated representations of multiple surface features, so that the retrieval of such traces induces vivid mental reinstatements of the target presentation (Brainerd & Reyna 2002). According to fuzzy-trace theory, there is also developmental variability in memory processing. Thus, acquisition, retention, and retrieval of both verbatim and gist memories improves as a child grows older into adulthood. Verbatim and gist memory improve because individuals are better able to process the meaning of items and are able to connect meaning across different domains. There are also different time courses of verbatim and gist memory. Verbatim access is favored when the surface content of retrieval cues matches that of targets and gist access is favored when retrieval cues match targets in meaning. Over time, the accessibility of verbatim traces decline more rapidly than that of gist traces.

Research Findings on Emotion

A growing body of research has begun to address the influence of affect on cognitive processes, including verbatim and gist memory performance (Erez & Isen, 2002). Everyday observations provide evidence that facts and events associated with strong emotions are better remembered than those that lack emotional ties. For example, in flashbulb memories, individuals retain very vivid and almost photographic memories of emotional events (Kensinger & Corkin, 2003). In addition, laboratory studies have confirmed that individuals are more likely to remember emotional rather than neutral information (Kensinger, 2004). When participants are shown a series of emotional and neutral stimuli, their ability to recall the emotional stimuli are significantly greater than the neutral stimuli. These effects on memory can be different for positive and negative mood states, although research regarding the details is inconclusive. Gray

(2001) found that positive moods could enhance performance on verbal working memory tasks, while negative moods could reduce performance. In contrast, Storbeck and Clore (2005) reported high levels of false memories when participants were in positive moods and a lower prevalence when they were in negative moods. When exposed to a list of words, each of which was highly associated with a different critical lure, individuals in happy moods recalled more critical lures that were never present compared to individuals in sad moods. Individuals in the positive mood condition, for example, were more likely to recall the word “sleep” (a critical lure) after studying associated words such as bed, pillow, awake, rest, wake, etc. than those individuals in the negative mood condition. As a result of conflicting evidence, more detailed research is needed on the influence of positive and negative mood states on memory processes.

Adolphs, Tranel, and Buchanan (2005) have demonstrated that amygdala damage impairs emotional memory for gist, but not the details of complex stimuli. It was also found that in emotionally arousing contexts, activation of the amygdala enhances memory for gist, but not the specific visual details. Mather (2006) has demonstrated that elderly adults show a positivity effect in memory, favoring information that is emotionally gratifying in their memories and forgetting information that might increase negative affect. Still, other studies have shown that merely activating the amygdala either positively or negatively may enhance memory for events (Pesta, 2001), while others such as Sharot, Delgado, and Phelps (2004) have shown that emotion may simply enhance the feeling of remembering without necessarily enhancing the objective accuracy of the memories themselves.

As a result of the conflicting evidence, there is little agreement regarding the fundamental effects of positive and negative emotion on false memory production. In addition, it is unclear which memory processes are affected by emotion -- verbatim, gist, or both verbatim and gist

memory. It is also difficult to compare results from different studies because two different methodological approaches have been used to investigate the effects of emotion on memory performance. Some investigators such as Kensinger use material and study words that are inherently emotional in nature (e.g., death, rape, kill, birth, celebration) to induce negative or positive emotions. Others researchers use a fixed group of neutral study words, and use an extraneous emotion induction procedure to induce different moods. It will be the goal of this research to investigate how affective states, both positive and negative, differentially influence memory performance. In particular, we will examine the likelihood of producing false memories in each emotion condition.

The design of this study will be founded primarily on the principles of fuzzy-trace theory (Brainerd & Reyna, 2005). According to fuzzy-trace theory, there are two retrieval processes in the brain, both dealing with the nature of information storage. Verbatim traces are clear, distinct, surface representations in the mind's eye. In contrast, gist traces are episodic interpretations of concepts and contain the semantic and relational meaning of the experience. We will use memory performance as an indicator of these two processes. According to the affect-as-information hypothesis (Clore et al, 2004), positive affective cues are believed to support relational processing. As a result, individuals in positive moods are more likely to establish connections and focus on a global understanding of the experience. In addition, individuals are more likely to process new information in relation to already established concepts (Storbeck & Clore, 2004). In contrast, negative affective cues are believed to result in item-specific processing. These individuals process incoming information independently of currently accessible concepts and focus on local aspects of what they experience (Storbeck & Clore, 2004). Thus, it is predicted that subjects in positive moods should be more prone to exhibit false

memory effects than those in negative moods. Since emotional affect is known to both enhance and impair memory processes, it is important to investigate how emotion influences memory storage.

The goal of this study will be to investigate how affective states differentially sway false memory effects using a method similar to that proposed by the Deese-Roediger-McDermott paradigm. The Deese-Roediger-McDermott paradigm involves the presentation of a list of words that are highly associated with a non-presented word, referred to as a critical lure. One list may include nurse, medicine, drugs, and hospital, which would activate the non-presented word *doctor*. In the DRM paradigm, gist traces may represent the general thematic content of the study list. After subjects hear or see such a list, they often show a tendency to falsely recall or recognize the critical lures, and it is this process that leads to false memory production.

In this study, subjects were induced into different emotional states prior to listening to a list of words they were later asked to recognize. Subjects were induced into either a negative, positive, or neutral (control) mood. This manipulation was done by three different word rating tasks, in which subjects were asked to rate 60 words that had been previously judged from a valence word pool of 844 words to be positive, negative, or neutral (Dumas, 2002). Subjects then listened to an audiotape of study words and were administered an immediate recognition memory test. This test consisted of different *types* of words - some presented (*targets*) and some not presented (*distractors* or *lures*). Each word on the recognition test was followed by one of three different types of probes and subjects responded “yes” or “no” depending on if the word was heard on the study list. This same test was administered one week later, and this marked the delayed memory test, which measured forgetting.

With this study, I hope to further investigate how emotional affect influences the encoding and retrieval of memory processes. I hypothesize a dissociation of verbatim and gists traces, but seek to investigate exactly which traces emotion disrupts. In addition, it is important to analyze which items on the test are influenced by emotion - targets or distractors. The implications of this study are numerous, as false memories are a component of daily living. Of particular importance is the role of memory in criminal identification and the reliability of testimony presented the courtroom. Physical evidence is collected in less than 10% of criminal investigations and when it is collected, it is only subject to forensic analysis in approximately half of the cases (Horvath & Meesig, 1996). This means that 90% of the evidence presented in the courtroom is based on memory reports, and it is therefore imperative that triers of fact are aware of the reliability of presented evidence. In addition, the study of false memories is also crucial in the medical field, as false memories may hinder medical treatment. For example, when using psychotherapy, an accurate recollection of past events is critical for proper diagnosis.

METHOD

The experiment was originally conducted by Dr. C. J. Brainerd. The data of the experiment were provided to me by Dr. Brainerd for use in my honors thesis project. The use of the data for all other purposes remains the property of Dr. Brainerd.

Participants

114 undergraduate college students completed the immediate memory test. Of the participants, 87 also completed the delayed memory test. Subjects were recruited from Cornell University and participated in the experiment to fulfill a course requirement. Participants were randomly assigned to an emotion condition (positive $n=39$, negative $n=39$, and neutral $n=36$).

Materials

Each participant was given a hardcopy of both an emotion induction task and a recognition memory test. The emotion induction task was administered first and consisted of 60 person descriptive words (e.g. smart, hateful) that had been previously judged from a valence word pool of 844 words to be the 60 most positive, 60 most negative, or 60 most neutral words (Dumas, 2002). See Appendix A for person descriptive words included in each emotion condition. The order in which the 60 words were presented was randomized across participants regardless of which emotion condition they received. Participants obtained all positive, all negative, or all neutral words depending on which condition group to which they had been assigned. Each word was rated on a dimensional scale from 1-7 on how the word made the individual feel - 1 being “very sad” and 7 being “very happy.”

The study words were administered through an audiotape, and consisted of 144 words, which were categorized into 24 lists. Presentation of the 24 lists of study words was randomized across different test sessions. Each list consisted of 6 words that were highly related. All lists were taken from McDermott and Watson (2001). See Appendix B for lists of study words used. Words were presented at a rate of 2 seconds per word with an 8 second pause between lists. Participants listened to the entire list of words before taking the recognition test. The immediate memory test included words from only 12 of the presented 24 lists. The order in which the 12 lists were tested on the recognition test was randomized across subjects. See Appendix C for the immediate memory recognition test. The test included five *types* of words: *targets* (word that was actually presented on the study list), *critical distractors* (word that is an example of a list theme and is an associate of all the targets), *related distractors* (word that is related to the target, but not an example of a list theme), *unrelated critical distractors* (word that is an example of a

list them, but is not associated with any of the targets), and *unrelated distractors* (word that is not an example of a list item, and is not related to any target words). Participants responded to each word on the recognition test by deciding whether the statement that followed it was true. Each word was randomly assigned to one of the following three probes (verbatim probe, gist probe, or verbatim + gist probe respectively):

It's a word I heard on one of the lists.	YES	NO
Not a word I heard, but it's related to one of the lists.	YES	NO
It's either a word I heard or a word that's related to one of the lists.	YES	NO

A delayed memory recognition test was administered one week after the immediate memory test and consisted of words from all 24 lists that were originally heard. See Appendix D for the delayed memory recognition test. A study period was not administered during this follow-up delayed memory test. As with the immediate test, presentation of the 24 lists on the recognition test was randomized across subjects. Previously tested words and non-previously tested words were presented in block design, but randomized across subjects. Thus, half of the participants received the block of words that were previously tested first, and the non-previously tested words second, and the other half received the block of non-previously tested words first, and the previously tested words second. Preliminary analyses indicate that the order of words presented on the immediate and delayed tests did not have any significant effects and thus will not be further explored.

Procedure

In this study, subjects were given an emotion induction task prior to studying a list of words that they were later asked to recognize on a memory test. Subjects were induced into either a negative, neutral, or positive mood using three different word-rating tasks. Each subject

was randomly assigned to one of the above emotion induction conditions. Examples of person descriptive words included in the negative, neutral, and positive emotion conditions are displayed below.

For example, under the negative emotion condition, when most people read the word WRETCHED, they respond as follows:

WRETCHED:

VERY SAD	PRETTY SAD	SLIGHTL Y SAD	NEITHER SAD NOR HAPPY	SLIGHTL Y HAPPY	PRETTY HAPPY	VERY HAPPY
X						

Thus, the word WRETCHED makes most people feel very sad when they read it.

Under the neutral emotion condition, when most people read the word OBLIGING, they respond as follows:

OBLIGING:

VERY SAD	PRETTY SAD	SLIGHTL Y SAD	NEITHER SAD NOR HAPPY	SLIGHTL Y HAPPY	PRETTY HAPPY	VERY HAPPY
			X			

Thus, the word OBLIGING does not make most people feel clearly happy or clearly sad when they read it.

Under the positive emotion condition, when most people read the word

TRUTHFUL, they respond as follows:

TRUTHFUL:

VERY SAD	PRETTY SAD	SLIGHTL Y SAD	NEITHER SAD NOR HAPPY	SLIGHTL Y HAPPY	PRETTY HAPPY	VERY HAPPY
						X

Thus, the word TRUTHFUL makes most people feel very happy when they read it.

After rating the 60 words on the given emotion induction task, the subjects were administered the study words via an audiotape. Participants listened to the entire list of words before taking the recognition test. This marked the immediate memory test, which included words from 12 of the presented 24 lists. Three specific types of questions representing verbatim probes, gist probes and verbatim + gist probes were presented on the recognition test, to which the participant was asked to answer either “yes” or “no”:

It’s a word I heard on one of the lists.	YES	NO
Not a word I heard, but it’s related to one of the lists.	YES	NO
It’s either a word I heard or a word that’s related to one of the lists.	YES	NO

The operational definition for true memory was evaluated by measuring how often subjects reported “yes” to recognizing words that were actually studied. The operational definition for false-memory was evaluated by measuring how often subjects reported “yes” to words that were not studied. The purpose of interweaving the three questions throughout the memory test was to separate the memory traces that subjects used when answering the questions. The questions helped to distinguish verbatim and gist traces. In addition, by including five

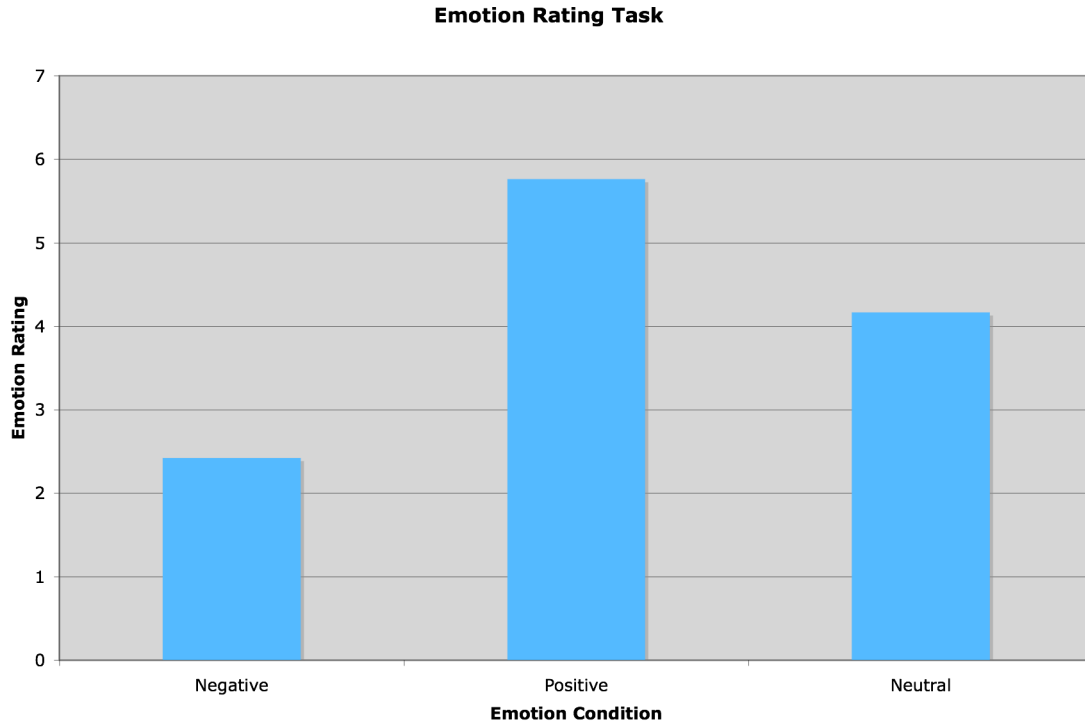
different *types* of words on the tests (*targets, critical distractors, related distractors, unrelated critical distractors, and unrelated distractors*), we are able to analyze what kinds of items were affected by valence of emotion - whether it was targets, distractors, or both. This test was administered again one week later without the studying phase, and this marked the delayed memory test, which measured the extent of forgetting. This test included words from all 24 lists that were originally heard on the audiotape.

RESULTS

Part 1: Emotion Induction Task (Manipulation Check)

To determine whether there was a significant difference between the ratings of words on the emotion induction task, a one-way analysis of variance was conducted on the three mood groups (positive, negative, neutral), with the mean emotion rating scores as the dependent measure (see Fig. 1). The ratings of person descriptive words on the emotion-word task were significantly different for each emotion condition, $F(2, 111) = 108.96, p < .01$. Participants in the Negative Emotion Condition ($M = 2.42, SD = .54$), those in the Positive Emotion Condition ($M = 5.76, SD = .58$), and those in Neutral Emotion Condition ($M = 4.17, SD = .34$) each gave different ratings.

FIGURE 1. Shows the mean rating of person descriptive words for each emotion manipulation condition (negative, positive, and neutral) on a dimensional mood scale from 1-7 (1=Very Sad, 7=Very Happy).



Part 2: Immediate Memory Recognition Test

A repeated measures analysis of variance (ANOVA) was conducted. This was a 3 (emotion induction condition: positive, negative, neutral) X 3 (type of probe: verbatim, gist, verbatim + gist) X 5 (type of item: target, critical distractor, related distractor, unrelated critical distractor, unrelated distractor) ANOVA. It was found that in this experiment, this particular emotion manipulation did not produce any significant main effects on the immediate test. However, we did find that there was a significant main effect for the 3 probes asked on the recognition test: verbatim, gist, and verbatim + gist, $F(2, 222) = 141.34, p < .01$ (see Fig. 2, Table. 1).

FIGURE 2. Mean proportion of acceptances on the immediate memory test for each of the three different probes: verbatim, gist, and verbatim + gist probe.

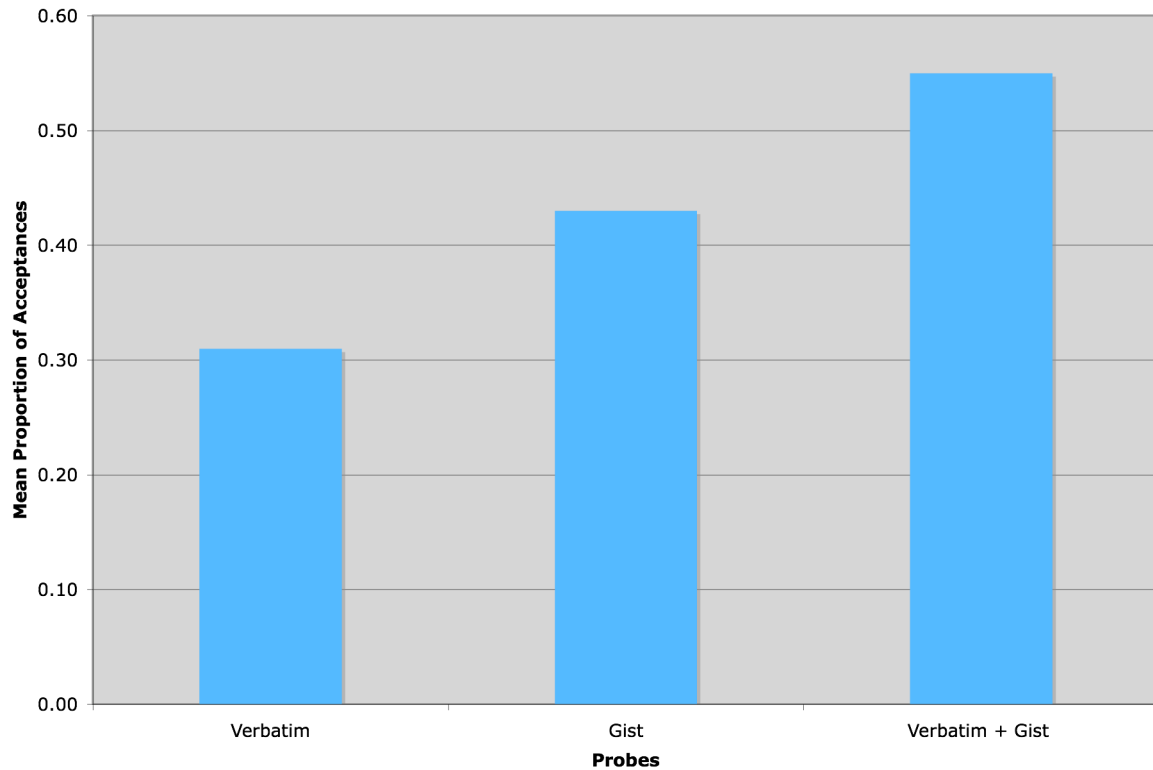


TABLE 1. Mean Probe Acceptance (*SD*)

Verbatim	0.31 (.22)
Gist	0.43 (.22)
Verbatim + Gist	0.55 (.22)

In addition, there was a significant main effect for the types of items presented on the test (*target, critical distractor, related distractor, unrelated critical distractor, unrelated distractor*), $F(4, 444) = 209.92, p < .01$ (see Fig. 3, Table 2).

FIGURE 3. Mean proportion of acceptances on the immediate memory test for the five different types of words presented (*targets, critical distractors, related distractor, unrelated critical distractor, and unrelated distractors*).

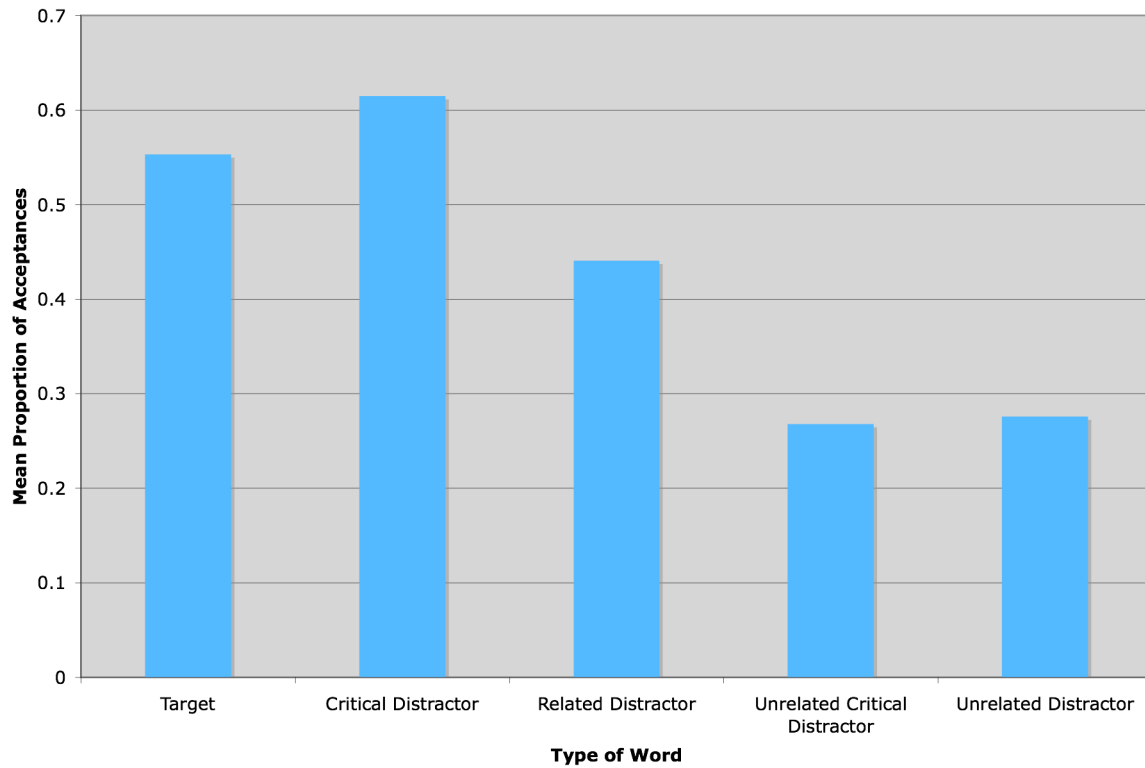


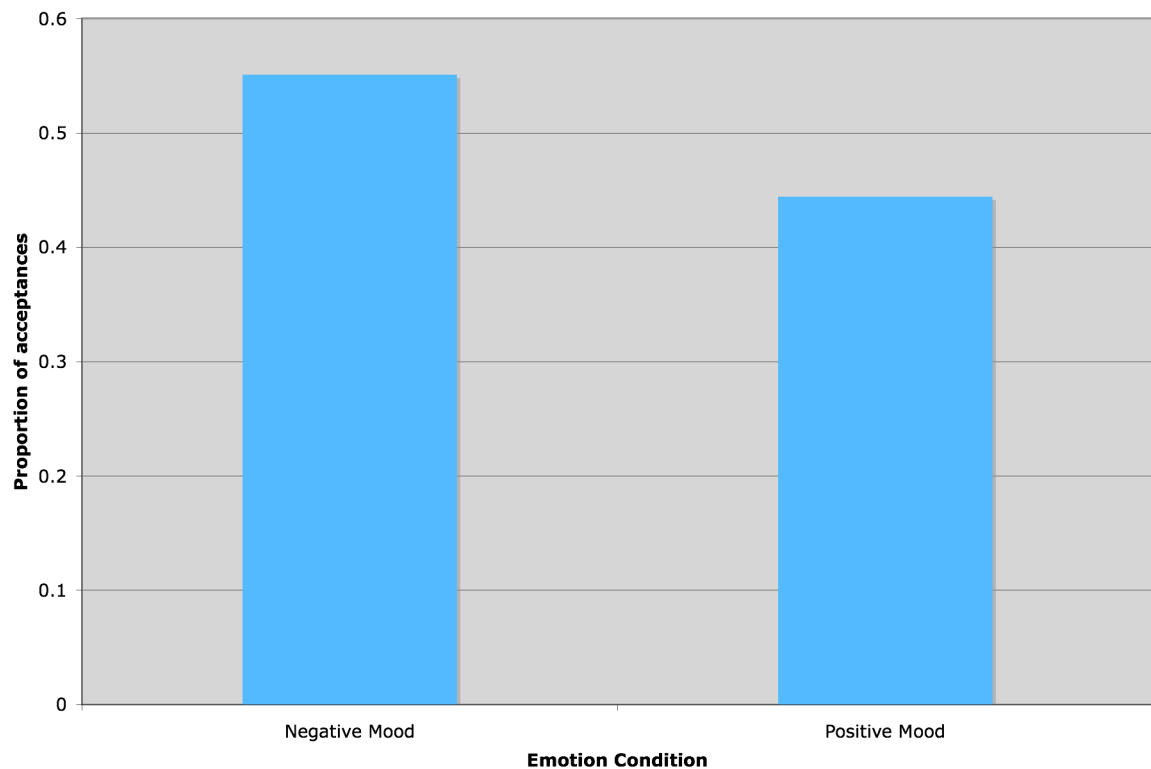
TABLE 2. Mean Type Acceptance (*SD*)

Target	0.553 (.19)
Critical Distractor	0.615 (.25)
Related Distractor	0.441 (.19)
Unrelated Critical Distractor	0.268 (.25)
Unrelated Distractor	0.276 (.20)

It was found that there were significant interactions between probe and type, $F(8, 888) = 19.10, p < .01$ and significant interactions between probe, type, and emotion factors as well, $F(16, 888) = 1.88, p < .05$. As expected, the proportion of acceptances for verbatim + gist probes were consistently the highest across all types of words. Although emotion did not seem

to have an effect on the proportion of target acceptances across emotion conditions, interestingly, in the negative emotion condition, the acceptance rate for critical distractors given a V probe ($M = .55$, $SD = .32$) was higher than the proportion of critical distractor acceptances given V probes ($M = .44$, $SD = .28$) in the positive emotion condition (see Fig 4).

FIGURE 4. Mean proportion of critical distractor acceptances given V probes for positive and negative emotion conditions.



Part 3: Delayed Recognition Test

Two repeated measures analyses of variance (ANOVA) were conducted, one for the previously tested words and one for the previously untested words. Each was a 3 (emotion condition: positive, negative, neutral) X 3 (type of probe: verbatim, gist, verbatim + gist) X 5

(*type* of item: target, critical distractor, related distractor, unrelated critical distractor, unrelated distractor) ANOVA.

Previously Tested Words

It was found that the main effect of emotion was significant in the delayed test for previously tested words, $F(2, 77) = 3.60, p < .05$ (see Table 3). Further analysis showed that acceptance rates of targets and critical distractors decreased in the negative emotion condition, but showed no difference between the positive and neutral mood conditions (See Table 4). In addition, there was a significant probe main effect, $F(2, 154) = 26.76, p < .01$ (see Table 5). Also, a significant main effect for the *types* of words on the recognition test was present, $F(4, 308) = 81.81, p < .01$ (see Table 6). Significant interactions between probe and type were also evident, $F(8, 616) = 11.82, p < .01$. The proportion of target acceptances given Verbatim + Gist probes for previously tested words ($M = .62, SD = .20$) did not decline much from the immediate memory test ($M = .71, SD = .17$).

TABLE 3. Mean proportion of acceptances across all word types and probes for the 3 emotion conditions (*SD*).

Negative	0.40 (.23)
Positive	0.47 (.22)
Neutral	0.45 (.24)

TABLE 4. Mean proportion of acceptances for various *types* of words on the delayed memory test (previously tested words) across the 3 different emotion conditions (*SD*).

	Targets	Critical Distractors	Related Distractors	Unrelated Distractors
Negative	0.46	0.53	0.44	0.28
Positive	0.57	0.62	0.52	0.32
Neutral	0.51	0.62	0.50	0.30

TABLE 5. Mean proportion of acceptances of verbatim, gist, and verbatim + gist probes (*SD*).

Verbatim	.37 (.23)
Gist	.44 (.24)
Verbatim + Gist	.50 (.23)

TABLE 6. Mean proportion of acceptances for the different *types* of words on the memory test (*SD*).

Target	.51 (.20)
Critical Distractor	.59 (.27)
Related Distractor	.49 (.21)
Unrelated Critical Distractor	.30 (.28)
Unrelated Distractor	.30 (.21)

Previously Untested Words

There was a significant probe main effect, $F(2, 168) = 17.21, p < .01$ (see Table. 7). Also, there was a significant main effect for the *types* of words present on the recognition test, $F(4, 336) = 39.87, p < .01$ (see Table. 8). Significant interactions between type and emotion were present, $F(8, 336) = 2.03, p < .05$ (see Table. 9). Positive emotion seemed to enhance the acceptance rates of critical distractors relative to other *types* of items. In addition, significant interactions between probe and type, $F(8, 672) = 2.66, p < .01$, were present. Verbatim memory for target words did not decline from the immediate memory test to the delayed test for the previously tested words. However, verbatim memory for target words that were not previously tested on the immediate test did decline (See Fig. 5). Interestingly, the acceptance rate for critical distractors was also higher for previously tested words ($M = .48, SD = .30$) than for

previously untested words ($M = .32$, $SD = .29$). In addition, the proportion of acceptances of critical distractors given a Verbatim + Gist probe for previously untested words ($M = .48$, $SD = .30$) was much less than the proportion of critical distractor acceptances given a Verbatim + Gist probe for previously tested words ($M = .74$, $SD = .25$). Also, the proportion of target acceptances given V + G probes for previously untested words ($M = .43$, $SD = .20$) declined greatly from the immediate memory test ($M = .71$, $SD = .17$).

TABLE 7. Mean proportion of acceptances of verbatim, gist, and verbatim + gist probes (SD).

Verbatim	.266 (.24)
Gist	.308 (.23)
Verbatim + Gist	.362 (.24)

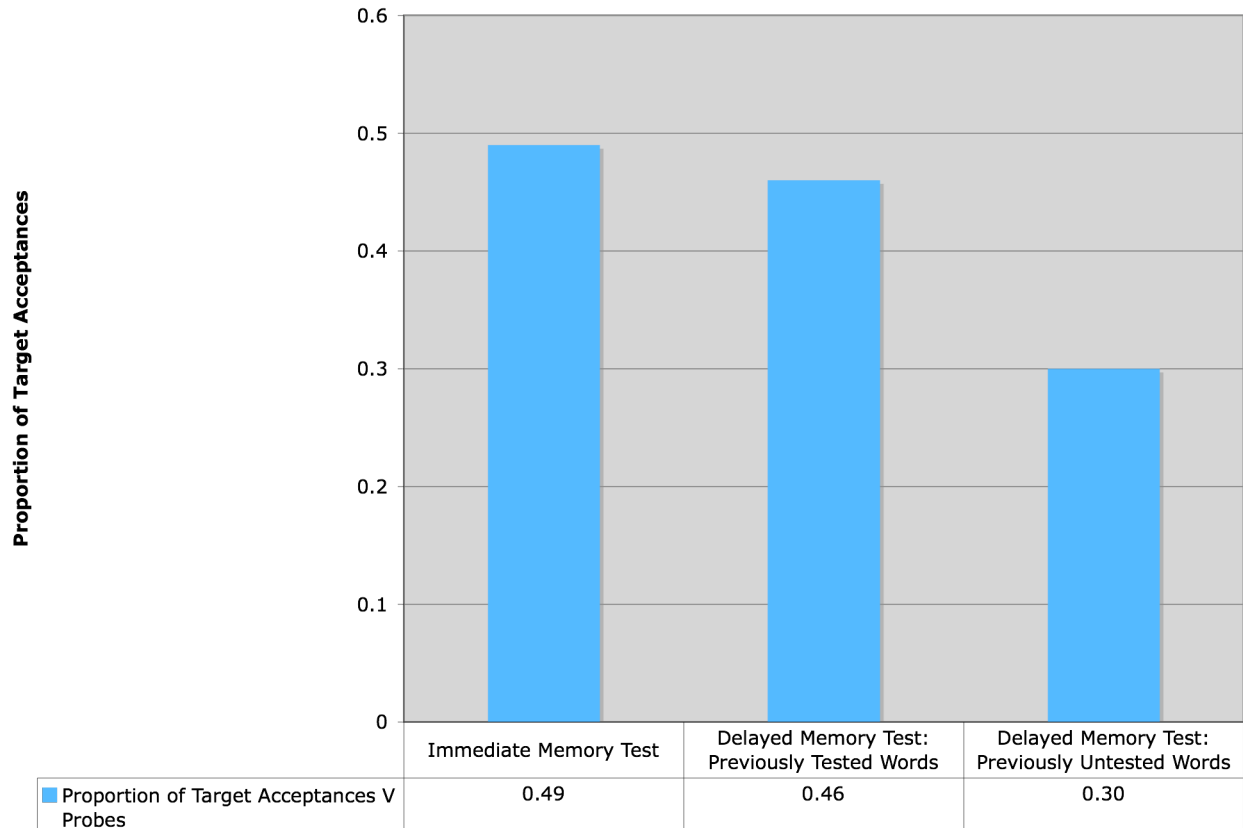
TABLE 8. Mean proportion of acceptances for the different *types* of words on the memory test (SD).

Target	.356 (.20)
Critical Distractor	.403 (.29)
Related Distractor	.301 (.22)
Unrelated Critical Distractor	.247 (.28)
Unrelated Distractor	.252 (.21)

TABLE 9. Mean proportion of acceptances for various *types* of words on the delayed memory test (previously untested words) across the 3 different emotion conditions (SD).

	Targets	Critical Distractors	Related Distractors	Unrelated Distractors
Negative	0.33 (.17)	0.39 (.25)	0.28 (.20)	0.25 (.25)
Positive	0.40 (.21)	0.44 (.32)	0.33 (.23)	0.24 (.22)
Neutral	0.33 (.22)	0.37 (.28)	0.28 (.21)	0.25 (.26)

FIGURE 5. Proportion of target acceptances given V probes during the immediate and delayed memory tests.



DISCUSSION

Memory performance is based on the retrieval of both verbatim and gist traces. In regards to recognition memory performance, there is an order of operations that individuals use when making recognition judgments according to fuzzy-trace theory. There is evidence suggesting that people first make a graded familiarity judgment as to whether or not they have seen a recognition test item previously based on gist. After this initial, fast process is completed, a more detailed and slower search for specific verbatim information ensues (Brainerd, Wright, Reyna, & Payne, 2002). Thus, a person initially makes an overall familiarity judgment and then conducts a search for confirming or disconfirming verbatim traces.

It is evident from the probe main effects on both the immediate and delayed test that participants understood the directions given on the recognition test and could distinguish between verbatim, gist, and verbatim + gist probes. As expected, the proportion of acceptances was highest for verbatim + gist probes across all *types* of words since people remember the meaning of words much more easily and fluently than the verbatim details. In addition, word *type* main effects were found in both the immediate and delayed tests, and it should be noted that critical distractors were more identifiable than targets themselves. This indicates that our memory for things that were not present is just as good, if not better than material that was actually studied. Fuzzy-trace theory's explanation of such data relies on the differential access by distractors and targets to the types of memories that are stored at study (Reyna & Lloyd, 1997). Prior findings suggest that target presentations lead to the formation of dissociated memories of their surface forms (verbatim traces) and of the various meanings that they cue (gist traces) (Reyna & Brainerd, 1995). Lists such as those presented in this experiment have an important feature because meanings are repeatedly cued, which results in strong gist memories of list themes. When given the immediate memory test, target acceptances can be based on verbatim traces of targets' surface features or gist traces of cued meanings, but the verbatim basis predominates. With distractors, gist is the predominant basis for false acceptance because verbatim traces of targets support the ability to reject words that were not presented on the test (e.g., being confident that you heard bed and not sleep). Critical distractors such as sleep and doctor are especially good retrieval cues for strong gist memories of list themes because they are associates of all of the targets. Thus, the memorial bases for target and distractor acceptance are different. The memorial basis for targets is verbatim-based and the memorial basis of critical distractors is gist-based. Because verbatim memories become inaccessible more rapidly than

gist, we obtain a false memory persistence effect.

In this study, it was found that on the immediate memory test, there was no difference between emotion conditions in regards to true recognition. Individuals in negative moods were just as good as individuals in positive moods at identifying targets. However, there was a significant difference between emotion conditions in the frequency of producing false alarms - a false sense of familiarity of words that were not actually heard on the audiotape. In regards to fuzzy-trace theory, since there were no differences in target acceptances across emotion conditions, this finding suggests that mood influences gist rather than verbatim representations of target words. Further analyses showed that positive mood impaired gist processing during the immediate memory test, while negative mood increased gist processing. As a result, individuals in the negative emotion condition were more susceptible to produce false memories and were more apt to accept critical distractors as being heard on the study list relative to the positive emotion condition. This may indicate that participants in the negative emotion condition were more likely to engage in relational processing, and thus more likely to produce false memories. Negative mood seemed to reinforce and strengthen memory for the meaning of objects and words, and thus had greatest influence on gist memory. These findings are inconsistent with the affect-as-information approach, according to which negative moods should lead to a reduction in relational processing, and greater use of item-specific processing. Although these findings are inconsistent with the findings of Storbeck and Clore (2005) on the effects of emotion on recall, it is well known that recognition tests and recall tests can produce different results in respect to different experimental manipulations (Seamon et al., 2002).

Although emotion seemed to have only influenced acceptance ratings of critical distractors on the immediate memory test, a main effect of emotion was observed on the delayed

memory test for previously tested words. Further analyses showed that the participants in the negative emotion condition were less likely to answer “yes” across all different probes and *types* of words relative to participants in the positive and neutral emotion conditions. Thus, negative emotion changes in two ways on the delayed memory test for previously tested words relative to the immediate memory test. On the delayed test, there is a decline in acceptance rates for targets. This effect was not present on the immediate test relative to the other emotion conditions. In addition, although negative mood seemed to influence the probability of accepting critical distractors on both the immediate and delayed memory tests, it did so in opposite directions. Negative mood increased acceptance rates of critical distractors on the immediate test, while decreasing acceptance rates on the delayed test. This was evident because verbatim memory dominates on the immediate memory test for targets and critical distractors, but to a lesser extent on the latter. On the other hand, gist memory dominates on the delayed memory test for both targets and distractors because verbatim memory degrades during the elapsed time. Thus, acceptance rates of targets and distractors are dissociated on the immediate memory test, but associated on the delayed test. The high levels of independence and experimental dissociation that are initially observed between true- and false-memory responses on the immediate test are replaced by a dependency and association as time goes on. Interestingly, positive mood seemed to increase acceptance rates for critical distractors on the delayed memory test for previously untested words. This finding suggests that positive mood helped preserve the meaning of the lists on the delayed memory test and led to an increase in false memories. Thus, positive emotion seems to decrease false memories on the immediate test, while elevating false memories on the delayed test.

The effect of emotion on the delayed memory test also provides evidence of a sleeper effect, which is recall of something that an individual is exposed to, but does not manifest immediately. We see this because emotion is a strong activator of gist traces. People are often good at remembering the valence of an event, but not the details. A strong verbatim memory may have interfered with the gist effect of emotion on the immediate test, but as verbatim memory degraded over time, the gist effect became more prominent. Although verbatim memory tends to degrade rapidly, this experiment shows that it is possible to inoculate the loss of both verbatim and gist traces by giving a prior memory test. As shown by the results in this experiment, verbatim memory for target words does not degrade for previously tested words, but does degrade for previously untested words. Thus, participants can increase memory performance for recognizing targets by administering a prior memory test. In addition, the immediate memory test may have also helped preserve the meaning of words that were presented, which explains the increase in false memories that were observed on the delayed memory test. By cuing meaning repeatedly, it was found that individuals falsely recognized more critical distractors as being heard on the audiotape if the words were previously tested on the immediate test than if they hadn't been.

A limitation of this study is that an emotional manipulation check was not administered to the participants before or after completing the immediate and delayed memory tests. Upon completion of the emotion induction task, participants could have filled out a mood questionnaire to evaluate their current affective state. While the emotion induction task is known to induce participants into different moods, it is unclear if participants still felt these emotions when they took the immediate memory test. By performing an emotional manipulation check, participants whose mood was not effectively manipulated could have been removed from the study, thereby

reducing error. In addition, participants' moods during the delayed memory test could have been different from that during the immediate memory test and may have influenced retrieval processes. Future research should seek to investigate different ways to effectively manipulate emotional affect in participants. In addition, although the emotion manipulation in this particular experiment only interfered with storage and encoding of information, future research should investigate how emotion interferes with retrieval as well. To do so, the emotion induction procedure should be given after administering the study words.

Nonetheless, despite its limitations, this experiment has numerous important implications in the realm of criminal investigations, as well as psychotherapy. By providing inaccurate reports of people or objects that were not present during the onset of a crime, witnesses could unintentionally lead to the prosecution and conviction of innocent people. In psychotherapy, therapists isolate the present symptoms of a patient by analyzing past events. Thus, if patients report false memories, this not only hinders the job of the therapist, but also prevents the resolution of the patient's symptoms.

Within the domain of criminal investigations, false-memory phenomena play an important role in witness interviews and interrogation of suspects, as well as eyewitness identification of suspects through photo spreads, show-ups, and line-ups. When interviewing witnesses in a criminal investigation, police officers often suggest to witnesses that they *could* have seen or heard certain things and have them assert to things they cannot clearly remember, but are consistent with the gist of the experience. By doing so, witnesses are more prone to report false things that are consistent with the gist of their experience, but did not actually occur. In addition, in photo spreads, when the culprit is absent, most or all of the options are consistent with the gist of witnesses' experience, which makes it difficult to identify one of them with high

confidence. Adding to this complexity is the emotional state of the victim or witness. As found in this experiment, emotion may interfere with our ability to disregard critical distractors that are consistent with the gist of target words.

Within the domain of psychotherapy, a number of practices such as memory work, guided imagery, and others are used to help recollect things that happened in the past. Often, patients are even asked to remember things that should have happened based on their feelings and intuitions. Such practices may lead to false memories, and may even be exacerbated depending on their present mood. Emotion influences memory processes in many ways, and it is important to consider the effects of emotion on false memory production when evaluating testimony of any kind.

References

- Adolphs, R., Tranel, D., & Buchanan, W. T. (2005). Amygdala damage impairs emotional memory for gist but not details of complex stimuli. *Nature Neuroscience*, 8, 512-518.
- Bartlett, F. C. (1932). *Remembering: A study in experimental and social psychology*. Cambridge: Cambridge University Press
- Brainerd, C. J., & Reyna, V. F. (2002). Fuzzy-trace theory and false memory. *Current directions in Psychological Science*, 11, 164-169.
- Brainerd, C. J., & Reyna, V. F. (2005). *The Science of False Memory* (pp. 59-96). New York: Oxford UP
- Brainerd, C.J., Wright, R., Reyna, V.F., & Payne, D.G. (2002). Dual-retrieval processes in free and associative recall. *Journal of Memory and Language*, 46, 120-152.
- Bransford, J.D., Barclay, J. R., & Franks, J. J. (1972). Sentence memory: A constructive versus Interpretative approach. *Cognitive Psychology*, 3, 193-209.
- Dumas, E., Jean. (2002). Likableness, familiarity, and frequency of 844 person-descriptive words. *Personality and Individual Differences*, 32, 523-531.
- Erez, A., & Isen, A. M. (2002). The Influence of Positive Affect on the Components of Expectancy Motivation. *Journal of Applied Psychology*, 87, 1055-1067
- Gray, J. (2001). Emotional modulation of cognitive control: approach-withdrawal states double-dissociate spatial from verbal two-back task performance. *Journal of Experimental Psychology: General*, 130, 436-452.
- Horvath, F., & Meesig, R. (1996). The criminal investigation process and the role of forensic evidence: A review of empirical findings. *Journal of Forensic Sciences*, 41, 963-969.

- Hintzman, D. L., Block, R. A., & Inskip, N. R. (1973). Memory for mode of input. *Journal of Verbal Learning and Verbal Behavior*, 11, 741-749
- Johnson, M. K., Hashtroudi, S., & Lindsay, D. S. (1993). Source monitoring. *Psychological Bulletin*, 114, 3-28
- Johnson, M.K., & Raye, C.L. (1981). Reality Monitoring. *Psychological Review*, 88, 67-85.
- Kensinger, E. A. (2004). Remembering emotional experiences: The contribution of valence and arousal. *Reviews in the Neurosciences*. 241-253.
- Kensinger, E. A., Corkin, S. (2003). Memory enhancement for emotional words: Are emotion words more vividly remembered than neutral words?. *Memory and Cognition*, 31, 1169-1180.
- Kolers, P. A. (1976). Reading a year later. *Journal of Experimental Psychology: Human Learning and Memory*, 2, 554-565
- Mather, M. (2006). Why Memories May Become More Positive as People Age. *Memory and Emotion: Interdisciplinary Perspectives*. 135-158.
- Pesta, B. J., Murphy, M. D., & Sanders, R. E. (2001). Are Emotional Charged Lures Immune to False Memory. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 27, 328-338.
- Reyna, V. F. (2000). Fuzzy-trace theory and source monitoring: An evaluation of theory and false-memory data. *Learning and Individual Differences*, 12, 163-17
- Reyna, V.F., & Brainerd, C.J. (1995). Fuzzy-trace theory: An interim synthesis. *Learning and Individual Differences*, 7, 1–75.

- Reyna, V. F., & Kienan, B. (1994). The development of gist versus verbatim memory in sentence recognition: Effects of lexical familiarity, semantic content, encoding instructions, and retention interval. *Developmental Psychology*, 30, 178-191
- Reyna, V. F., & Lloyd, F. (1997). Theories of false memory in children and adults. *Learning and Individual Differences*, 9, 95-123.
- Roediger, H., Watson, J., McDermott, K., & Gallo, D. (2001). Factors that determine false recall: A multiple regression analysis. *Psychonomic Bulletin & Review*, 8, 385–407.
- Seamon, J. G., Luo, C. R., Kopecky, J. J., Price, C. A., Rothschild, L., Fung, N.S., & Schwarz, M. A. (2002). Are false memories more difficult to forget than accurate memories? The effects of retention interval on recall and recognition. *Memory & Cognition*, 30, 1054-1064.
- Sharot, T., Delgado M. R., & Phelps, E. A. (2004). How emotion enhances the feeling of remembering. *Nature Neuroscience*, 7, 1376-1380.
- Storbeck, J., & Clore, G.L. (2004). *Turning on and off affective and categorical priming with mood*. Manuscript submitted for publication.
- Storbeck, J., & Clore, G. L. (2005). With Sadness Comes Accuracy; With Happiness, False Memory. *Psychological Science*, 16, 785-791.
- Strong, E. K. (1913). The effect of time-interval upon recognition memory. *Psychological Review*, 20, 339-371.

Appendix A

INSTRUCTIONS FOR RATING THE EMOTIONAL CONTENT OF WORDS

Certain words are able to stimulate our emotions. Writers of novels and short stories are experts at using such words to make us feel a range of emotions when we read them. Some words are extremely negative and make us feel very sad, depressed, and sorrowful. Other negative words also make us feel sad but not quite so sad. In contrast, some words are extremely positive and make us feel very happy, joyous, and elated. Other positive words also make us feel happy but not quite so happy. Finally, there are some other words that are emotionally neutral. Those words do not make us feel clearly happy or clearly sad.

The purpose of this task is for you to tell us how some of the words that writers use to stimulate our emotions make you feel when you read them. On the next 10 pages, you will find a series of words. Underneath each word is a grid that you should use to tell us how the word made you feel when you read it. The grid looks like this:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

To tell us how each word made you feel when you read it, all you have to do is check the appropriate box under the label that most closely describes what you felt. For example, when most people read the word WRETCHED, they respond as follows:

WRETCHED:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY
X						

Thus, the word WRETCHED makes most people feel very sad when they read it.

On this task, it is very important for you to tell us **how each word actually makes you feel**. We **don't** want you to tell us how you think you should feel when you read each word or how you think most people would feel. We want to know how **you feel** when you read each word.

There are some easy methods that you can use to decide how a word makes you feel. When you read a word, think of what the word says as though it applied to you personally. How does that make you feel? Just let the emotion come to you, experience it, and **don't** try to resist it. Then, check the box that most nearly describes what it was like.

Another method you can use to decide how a word makes you feel is to remember some past event that has happened to you that the word brings to mind. How did that event make you feel? Again, just let the emotion come to you, experience it, and **don't** try to resist it. Then, check the box that most nearly describes what it was like.

Please do not turn the page over yet. Please wait quietly while other people finish reading the instructions. Then, I will tell you to begin.

Person descriptive words used on the *negative* emotion induction task:**DISHONEST:**

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

ANGRY:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

IRRITABLE

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

PHONY:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

UNGRACIOUS:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

NEGLECTFUL:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

ABUSIVE:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

SUICIDAL:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

INSINCERE:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

TERRIBLE:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

VENGEFUL:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

DECEITFUL:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

HATEFUL:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

UNFORGIVING:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

DULL:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

DISHONORABLE:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

GREEDY:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

UNTRUSTWORTHY:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

DISTRUSTFUL:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

SELFISH:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

DISOBEDIENT:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

ATTACKING:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

UNINTERESTING:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

VICIOUS:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

HEARTLESS:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

UNRELIABLE:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

DECEPTIVE:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

UNPLEASANT:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

UNKINDLY:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

INSULTING:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

UNTRUTHFUL:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

UNFAIR:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

NAGGING:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

GROUCHY:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

DISMAL:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

DISLIKABLE:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

ANNOYING:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

MEAN:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

CRANKY:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

RUDE:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

MANIPULATIVE:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

CRUEL:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

AWFUL:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

IRRITATING:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

CRABBY:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

UNKIND:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

DISGUSTING:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

UNGRATEFUL:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

NASTY:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

DISCRIMINATING:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

COLD:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

BITTER:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

IMPOLITE:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

UNFRIENDLY:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

DISRESPECTFUL:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

DISCOURTEOUS:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

VIOLENT:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

UNAPPRECIATIVE:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

PATHETIC:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

LIAR:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

Person descriptive words used on the *neutral* emotion induction task:**METICULOUS:**

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

BASHFUL:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

MATERIAL:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

AMOROUS:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

INFORMAL:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

PERFECTIONIST:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

METHODICAL:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

NONCONFORMING:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

CHEEKY:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

RADICAL:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

SARCASTIC:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

IMPULSIVE:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

OPINIONATED:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

SELF-RIGHTEOUS:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

SELF-CRITICAL:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

BLUNT:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

NONCHALANT:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

DISCREET:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

ROBUST:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

UPRIGHT:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

PERSUASIVE:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

SEDUCTIVE:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

THEATRICAL:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

IMPRESSIONABLE:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

AFFABLE:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

VIGOROUS:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

FRISKY:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

FRANK:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

SUBTLE:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

GENIAL:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

HEADSTRONG:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

BOISTEROUS:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

SKEPTICAL:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

DRAMATIC:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

ABANDONED:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

TOUGH:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

SELF-CONSCIOUS:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

SUPERSTITIOUS:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

INEXPERIENCED:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

CLUMSY:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

SATIRICAL:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

QUIET:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

RACING:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

OLD-FASHIONED:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

JOVIAL:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

MODERATE:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

RENEWED:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

FLAMBOYANT:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

UNPREDICTABLE:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

INTENSE:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

INVINCIBLE:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

SHY:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

BRISK:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

RESERVED:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

BRIMMING:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

COERCIVE:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

SELF-CONCERNED:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

MEDITATIVE:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

REMORSEFUL:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

VIGILANT:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

Person descriptive words used on the *positive* emotion induction task:**CARING:**

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

GRACIOUS:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

GLAD:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

COMFORTING:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

ROMANTIC:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

POSITIVE:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

LOYAL:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

PASSIONATE:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

RELIABLE:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

HUMOROUS:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

COMPANIONABLE:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

GOOD-HUMORED:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

HONEST:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

CLEVER:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

PATIENT:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

TRUSTFUL:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

GOOD-NATURED:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

INTERESTING:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

FRIENDLY:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

EXTRAORDINARY:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

POLITE:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

COURTEOUS:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

OUTSTANDING:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

NICE:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

AMUSING:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

ACTIVE:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

HIGH-SPIRITED:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

KIND-HEARTED:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

TRUSTING:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

CONSIDERATE:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

AFFECTIONATE:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

EDUCATED:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

EASY-GOING:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

GENEROUS:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

HILARIOUS:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

GOOD-TEMPERED:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

TRUSTWORTHY:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

OPEN-MINDED:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

ENTHUSIASTIC:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

WARM-HEARTED:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

GRATEFUL:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

GREAT:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

LOVABLE:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

UNDERSTANDING:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

RESPECTFUL:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

RESPONSIBLE:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

WONDERFUL:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

HONORABLE:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

LOVING:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

ADVENTUROUS:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

FORGIVING:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

GOOD:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

DEPENDABLE:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

ENTERTAINING:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

KIND:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

INTELLIGENT:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

ADMIRABLE:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

CLEAN:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

CHEERFUL:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

GENUINE:

VERY SAD	PRETTY SAD	SLIGHTLY SAD	NEITHER SAD NOR HAPPY	SLIGHTLY HAPPY	PRETTY HAPPY	VERY HAPPY

Appendix B**STUDY WORDS:**

List 1:

hot, snow, warm, winter, ice, wet

“NEXT LIST”

List 2:

nose, breathe, sniff, aroma, hear, see

“NEXT LIST”

List 3:

door, glass, pane, shade, ledge, sill

“NEXT LIST”

List 4:

smooth, bumpy, road, tough, sandpaper, jagged

“NEXT LIST”

List 5:

mug, saucer, tea, measuring, coaster, lid

“NEXT LIST”

List 6:

hard, light, pillow, plush, loud, cotton

“NEXT LIST”

List 7:

bed, rest, awake, tired, dream, wake

“NEXT LIST”

List 8:

want, desire, hope, well, think, star

“NEXT LIST”

List 9:

mad, fear, hate, rage, temper, fury

“NEXT LIST”

List 10:

garbage, waste, can, refuse, sewage, bag

“NEXT LIST”

List 11:

peace, law, courts, judge, right, liberty

“NEXT LIST”

List 12:

table, sit, legs, seat, couch, desk

“NEXT LIST”

List 13:

cigarette, puff, blaze, billows, pollution, ashes

“NEXT LIST”

List 14:

low, clouds, up, tall, tower, jump

“NEXT LIST”

List 15:

nurse, sick, medicine, health, hospital, dentist

“NEXT LIST”

List 16:

hot, heat, pipe, cook, warm, fire

“NEXT LIST”

List 17:

steal, robber, crook, burglar, money, cop

“NEXT LIST”

List 18:

hill, valley, climb, summit, top, molehill

“NEXT LIST”

List 19:

note, sound, piano, sing, radio, band

“NEXT LIST”

List 20:

fast, lethargic, stop, listless, snail, caution

“NEXT LIST”

List 21:

thread, pin, eye, sewing, sharp, point

“NEXT LIST”

List 22:

water, stream, lake, Mississippi, boat, tide

“NEXT LIST”

List 23:

elastic, bounce, gloves, tire, ball, eraser

“NEXT LIST”

List 24:

town, crowded, state, capital, streets, subway

Appendix C

IMMEDIATE MEMORY TEST INSTRUCTIONS

You have just listened to a recording of several short lists of vocabulary words. Now, you are going to take a memory test to see what you can remember about the words that you listened to. The test will proceed as follows.

On the next 6 pages, you will find a series of tables with words on the left side of each line, followed by a statement that you have to answer about each word. **Please do not turn the page over yet. Wait until I tell you to do so.**

Some of the words in these tables will be old words that you just heard on the tape recording. Other words in these tables will be new words that you did not hear on any of the lists **but that are related to the words on one of the lists in the sense that they have similar meanings**. For instance, imagine that one of the short lists that you heard was QUEEN, ENGLAND, CROWN, PRINCE, GEORGE, DICTATOR. If you saw the words KING, THRONE, and PALACE in the upcoming tables, you would say that all of the words are new but that they are all related in meaning to this short list.

Finally, still other words in the tables will be unlike anything you heard on any of the short lists. For example, suppose that the only list that you heard was the Aroyal@ words in the preceding paragraph. If you saw the words COMPUTER, PINE, and SODIUM in the upcoming tables, you would say that all of the words are new and they are not related in meaning to the short list. They are brand new in every respect.

In the upcoming tables, you will have to respond to each word by deciding whether the statement that follows it is true. Each word is followed by one of three statements:

It's a word I heard on one of the lists.	YES	NO
Not a word I heard, but it's related to one of the lists.	YES	NO
It's either a word I heard or a word that's related to one of the lists.	YES	NO

For example, suppose that the only list that you heard was the short list of Aroyal@ words, above. The table of test words might look like the one you see below. Read through the table and be sure you understand why each answer that has been underlined on the far right is the correct one:

KING	It's a word I heard on one of the lists.	YES	<u>NO</u>
PALACE	Not a word I heard, but it's related to one of the lists.	<u>YES</u>	NO
CROWN	It's either a word I heard or a word that's related to one of the lists.	<u>YES</u>	NO
SODIUM	Not a word I heard, but it's related to one of the lists.	YES	<u>NO</u>
ENGLAND	It's a word I heard on one of the lists.	<u>YES</u>	NO
COMPUTER	It's either a word I heard or a word that's related to one of the lists.	YES	<u>NO</u>
THRONE	It's either a word I heard or a word that's related to one of the lists.	<u>YES</u>	NO
DICTATOR	Not a word I heard, but it's related to one of the lists.	YES	<u>NO</u>
PINE	It's a word I heard on one of the lists.	YES	<u>NO</u>

The answer is no to the first question because KING was not on the Aroyal@ list, the answer is yes to the second question because PALACE is related to the Aroyal@ list, the answer is yes to the third question because CROWN was on the list, the answer is no to the fourth question because SODIUM is not related to the Aroyal@ list, the answer is yes to the fifth question because ENGLAND was on the list, the answer is no to the sixth question because COMPUTER was not on the list and is not related to the Aroyal@ list, the answer is yes to the seventh question because THRONE is related to the Aroyal@ list, the answer is no to the eighth question because DICTATOR was on the list, and the answer is no to the ninth question because PINE was not on the list.

In just a moment, I will ask you to turn the page over and read all the words on the memory test and answer all the questions about them. Answer each question by circling either YES or NO.

Please do not turn the page over yet. Please wait quietly while other people finish reading the instructions. Then, I will tell you to begin.

SNOW	It's a word I heard on one of the lists.	YES	NO
TRAFFIC	Not a word I heard, but it's related to one of the lists.	YES	NO
STARS	It's either a word I heard or a word that's related to one of the lists.	YES	NO
PIN	Not a word I heard, but it's related to one of the lists.	YES	NO
CIGAR	It's either a word I heard or a word that's related to one of the lists.	YES	NO
COLD	It's a word I heard on one of the lists.	YES	NO
LETHARGIC	It's either a word I heard or a word that's related to one of the lists.	YES	NO
BREAD	It's a word I heard on one of the lists.	YES	NO
OBEY	Not a word I heard, but it's related to one of the lists.	YES	NO

HIGH	Not a word I heard, but it's related to one of the lists.	YES	NO
EYE	It's either a word I heard or a word that's related to one of the lists.	YES	NO
BONE	It's a word I heard on one of the lists.	YES	NO
TOE	It's either a word I heard or a word that's related to one of the lists.	YES	NO
SNIFF	It's a word I heard on one of the lists.	YES	NO
CITIZEN	Not a word I heard, but it's related to one of the lists.	YES	NO
ARMY	It's a word I heard on one of the lists.	YES	NO
LISTLESS	Not a word I heard, but it's related to one of the lists.	YES	NO
PHYSICIAN	It's either a word I heard or a word that's related to one of the lists.	YES	NO

BUILDING	It's either a word I heard or a word that's related to one of the lists.	YES	NO
FIGHT	It's a word I heard on one of the lists.	YES	NO
PIANO	Not a word I heard, but it's related to one of the lists.	YES	NO
COUNTRY	It's a word I heard on one of the lists.	YES	NO
EAT	Not a word I heard, but it's related to one of the lists.	YES	NO
MEDICINE	It's either a word I heard or a word that's related to one of the lists.	YES	NO
SMELL	Not a word I heard, but it's related to one of the lists.	YES	NO
COMMAND	It's either a word I heard or a word that's related to one of the lists.	YES	NO
SHADE	It's a word I heard on one of the lists.	YES	NO

SMOKE	It's a word I heard on one of the lists.	YES	NO
SING	It's either a word I heard or a word that's related to one of the lists.	YES	NO
HAYSTACK	Not a word I heard, but it's related to one of the lists.	YES	NO
PERSON	Not a word I heard, but it's related to one of the lists.	YES	NO
SANDWICH	It's either a word I heard or a word that's related to one of the lists.	YES	NO
REST	It's a word I heard on one of the lists.	YES	NO
FLAG	It's a word I heard on one of the lists.	YES	NO
SICK	Not a word I heard, but it's related to one of the lists.	YES	NO
CONCERT	It's either a word I heard or a word that's related to one of the lists.	YES	NO

CHILLY	Not a word I heard, but it's related to one of the lists.	YES	NO
WINDOW	It's either a word I heard or a word that's related to one of the lists.	YES	NO
HOPE	It's a word I heard on one of the lists.	YES	NO
HAND	It's a word I heard on one of the lists.	YES	NO
TALL	Not a word I heard, but it's related to one of the lists.	YES	NO
AMERICAN	It's either a word I heard or a word that's related to one of the lists.	YES	NO
ILL	It's a word I heard on one of the lists.	YES	NO
BILLOWS	It's either a word I heard or a word that's related to one of the lists.	YES	NO
FOOT	Not a word I heard, but it's related to one of the lists.	YES	NO

MUSIC	It's a word I heard on one of the lists.	YES	NO
SYMBOL	Not a word I heard, but it's related to one of the lists.	YES	NO
CLOUDS	It's either a word I heard or a word that's related to one of the lists.	YES	NO
HUSBAND	It's a word I heard on one of the lists.	YES	NO
GIRL	It's either a word I heard or a word that's related to one of the lists.	YES	NO
SCENT	Not a word I heard, but it's related to one of the lists.	YES	NO
BLAZE	Not a word I heard, but it's related to one of the lists.	YES	NO
DELAY	It's either a word I heard or a word that's related to one of the lists.	YES	NO
RAGE	It's a word I heard on one of the lists.	YES	NO

HATE	Not a word I heard, but it's related to one of the lists.	YES	NO
GOOD	It's either a word I heard or a word that's related to one of the lists.	YES	NO
PUFF	It's a word I heard on one of the lists.	YES	NO
HOUSE	Not a word I heard, but it's related to one of the lists.	YES	NO
HEALTH	It's a word I heard on one of the lists.	YES	NO
THIMBLE	It's either a word I heard or a word that's related to one of the lists.	YES	NO
WELL	It's either a word I heard or a word that's related to one of the lists.	YES	NO
FEMALE	Not a word I heard, but it's related to one of the lists.	YES	NO
SLEEP	It's a word I heard on one of the lists.	YES	NO

LAMP	Not a word I heard, but it's related to one of the lists.	YES	NO
FEAR	It's either a word I heard or a word that's related to one of the lists.	YES	NO
MELODY	It's a word I heard on one of the lists.	YES	NO
FOUNTAIN	It's either a word I heard or a word that's related to one of the lists.	YES	NO
UP	It's a word I heard on one of the lists.	YES	NO
DESIRE	Not a word I heard, but it's related to one of the lists.	YES	NO
DOLLS	It's a word I heard on one of the lists.	YES	NO
SLOW	Not a word I heard, but it's related to one of the lists.	YES	NO
HEAT	It's either a word I heard or a word that's related to one of the lists.	YES	NO

WHIFF	It's a word I heard on one of the lists.	YES	NO
AWAKE	Not a word I heard, but it's related to one of the lists.	YES	NO
MAN	It's either a word I heard or a word that's related to one of the lists.	YES	NO
WISH	Not a word I heard, but it's related to one of the lists.	YES	NO
PANE	It's either a word I heard or a word that's related to one of the lists.	YES	NO
SHADE	It's a word I heard on one of the lists.	YES	NO
HATRED	It's either a word I heard or a word that's related to one of the lists.	YES	NO
HEALTH	It's a word I heard on one of the lists.	YES	NO
WRITE	Not a word I heard, but it's related to one of the lists.	YES	NO

BLANKET	Not a word I heard, but it's related to one of the lists.	YES	NO
TIRED	It's either a word I heard or a word that's related to one of the lists.	YES	NO
PEN	It's a word I heard on one of the lists.	YES	NO
GLASS	Not a word I heard, but it's related to one of the lists.	YES	NO
SOUND	It's a word I heard on one of the lists.	YES	NO
NEEDLE	It's either a word I heard or a word that's related to one of the lists.	YES	NO
TABLE	It's either a word I heard or a word that's related to one of the lists.	YES	NO
HAPPINESS	Not a word I heard, but it's related to one of the lists.	YES	NO
FRIGID	It's a word I heard on one of the lists.	YES	NO

ANGER	It's either a word I heard or a word that's related to one of the lists.	YES	NO
STOP	It's a word I heard on one of the lists.	YES	NO
RING	Not a word I heard, but it's related to one of the lists.	YES	NO
SHUTTER	It's a word I heard on one of the lists.	YES	NO
SPIDER	Not a word I heard, but it's related to one of the lists.	YES	NO
WINTER	It's either a word I heard or a word that's related to one of the lists.	YES	NO
AROMA	Not a word I heard, but it's related to one of the lists.	YES	NO
UNCLE	It's either a word I heard or a word that's related to one of the lists.	YES	NO
INSECT	It's a word I heard on one of the lists.	YES	NO

SNOOZE	It's a word I heard on one of the lists.	YES	NO
TROUBLE	It's either a word I heard or a word that's related to one of the lists.	YES	NO
WARM	Not a word I heard, but it's related to one of the lists.	YES	NO
SHOOTER	Not a word I heard, but it's related to one of the lists.	YES	NO
DOCTOR	It's either a word I heard or a word that's related to one of the lists.	YES	NO
WORRY	It's a word I heard on one of the lists.	YES	NO
SEWING	It's a word I heard on one of the lists.	YES	NO
WRATH	Not a word I heard, but it's related to one of the lists.	YES	NO
BREATHE	It's either a word I heard or a word that's related to one of the lists.	YES	NO

Appendix D

DELAYED MEMORY TEST INSTRUCTIONS

In the first session of this experiment, you listened to a recording of several short lists of vocabulary words. Now, you are going to take another memory test to see what you can remember about the words that you listened to. The test will proceed as follows.

On the next 12 pages, you will find a series of tables with words on the left side of each line, followed by a statement that you have to answer about each word. **Please do not turn the page over yet. Wait until I tell you to do so.**

Some of the words in these tables will be old words that you heard on the tape recording. Other words in these tables will be new words that you did not hear on any of the lists **but that are related to the words on one of the lists in the sense that they have similar meanings**. For instance, imagine that one of the short lists that you heard was QUEEN, ENGLAND, CROWN, PRINCE, GEORGE, DICTATOR. If you saw the words KING, THRONE, and PALACE in the upcoming tables, you would say that all of the words are new but that they are all related in meaning to this short list.

Finally, still other words in the tables will be unlike anything you heard on any of the short lists. For example, suppose that the only list that you heard was the Aroyal@ words in the preceding paragraph. If you saw the words COMPUTER, PINE, and SODIUM in the upcoming tables, you would say that all of the words are new and they are not related in meaning to the short list. They are brand new in every respect.

In the upcoming tables, you will have to respond to each word by deciding whether the statement that follows it is true. Each word is followed by one of three statements:

It=s a word I heard on one of the lists.	YES	NO
Not a word I heard, but it=s related to one of the lists.	YES	NO
It=s either a word I heard or a word that=s related to one of the lists.	YES	NO

For example, suppose that the only list that you heard was the short list of Aroyal@ words, above. The table of test words might look like the one you see below. Read through the table and be sure you understand why each answer that has been underlined on the far right is the correct one:

KING	It's a word I heard on one of the lists.	YES	<u>NO</u>
PALACE	Not a word I heard, but it's related to one of the lists.	<u>YES</u>	NO
CROWN	It's either a word I heard or a word that's related to one of the lists.	<u>YES</u>	NO
SODIUM	Not a word I heard, but it's related to one of the lists.	YES	<u>NO</u>
ENGLAND	It's a word I heard on one of the lists.	<u>YES</u>	NO
COMPUTER	It's either a word I heard or a word that's related to one of the lists.	YES	<u>NO</u>
THRONE	It's either a word I heard or a word that's related to one of the lists.	<u>YES</u>	NO
DICTATOR	Not a word I heard, but it's related to one of the lists.	YES	<u>NO</u>
PINE	It's a word I heard on one of the lists.	YES	<u>NO</u>

The answer is no to the first question because KING was not on the Aroyal@ list, the answer is yes to the second question because PALACE is related to the Aroyal@ list, the answer is yes to the third question because CROWN was on the list, the answer is no to the fourth question because SODIUM is not related to the Aroyal@ list, the answer is yes to the fifth question because ENGLAND was on the list, the answer is no to the sixth question because COMPUTER was not on the list and is not related to the Aroyal@ list, the answer is yes to the seventh question because THRONE is related to the Aroyal@ list, the answer is no to the eighth question because DICTATOR was on the list, and the answer is no to the ninth question because PINE was not on the list.

In just a moment, I will ask you to turn the page over and read all the words on the memory test and answer all the questions about them. Answer each question by circling either YES or NO.

Please do not turn the page over yet. Please wait quietly while other people finish reading the instructions. Then, I will tell you to begin.

SNOW	It's a word I heard on one of the lists.	YES	NO
TRAFFIC	Not a word I heard, but it's related to one of the lists.	YES	NO
STARS	It's either a word I heard or a word that's related to one of the lists.	YES	NO
PIN	Not a word I heard, but it's related to one of the lists.	YES	NO
CIGAR	It's either a word I heard or a word that's related to one of the lists.	YES	NO
COLD	It's a word I heard on one of the lists.	YES	NO
LETHARGIC	It's either a word I heard or a word that's related to one of the lists.	YES	NO
BREAD	It's a word I heard on one of the lists.	YES	NO
OBEY	Not a word I heard, but it's related to one of the lists.	YES	NO

HIGH	Not a word I heard, but it's related to one of the lists.	YES	NO
EYE	It's either a word I heard or a word that's related to one of the lists.	YES	NO
BONE	It's a word I heard on one of the lists.	YES	NO
TOE	It's either a word I heard or a word that's related to one of the lists.	YES	NO
SNIFF	It's a word I heard on one of the lists.	YES	NO
CITIZEN	Not a word I heard, but it's related to one of the lists.	YES	NO
ARMY	It's a word I heard on one of the lists.	YES	NO
LISTLESS	Not a word I heard, but it's related to one of the lists.	YES	NO
PHYSICIAN	It's either a word I heard or a word that's related to one of the lists.	YES	NO

BUILDING	It's either a word I heard or a word that's related to one of the lists.	YES	NO
FIGHT	It's a word I heard on one of the lists.	YES	NO
PIANO	Not a word I heard, but it's related to one of the lists.	YES	NO
COUNTRY	It's a word I heard on one of the lists.	YES	NO
EAT	Not a word I heard, but it's related to one of the lists.	YES	NO
MEDICINE	It's either a word I heard or a word that's related to one of the lists.	YES	NO
SMELL	Not a word I heard, but it's related to one of the lists.	YES	NO
COMMAND	It's either a word I heard or a word that's related to one of the lists.	YES	NO
SHADE	It's a word I heard on one of the lists.	YES	NO

SMOKE	It's a word I heard on one of the lists.	YES	NO
SING	It's either a word I heard or a word that's related to one of the lists.	YES	NO
HAYSTACK	Not a word I heard, but it's related to one of the lists.	YES	NO
PERSON	Not a word I heard, but it's related to one of the lists.	YES	NO
SANDWICH	It's either a word I heard or a word that's related to one of the lists.	YES	NO
REST	It's a word I heard on one of the lists.	YES	NO
FLAG	It's a word I heard on one of the lists.	YES	NO
SICK	Not a word I heard, but it's related to one of the lists.	YES	NO
CONCERT	It's either a word I heard or a word that's related to one of the lists.	YES	NO

CHILLY	Not a word I heard, but it's related to one of the lists.	YES	NO
WINDOW	It's either a word I heard or a word that's related to one of the lists.	YES	NO
HOPE	It's a word I heard on one of the lists.	YES	NO
HAND	It's a word I heard on one of the lists.	YES	NO
TALL	Not a word I heard, but it's related to one of the lists.	YES	NO
AMERICAN	It's either a word I heard or a word that's related to one of the lists.	YES	NO
ILL	It's a word I heard on one of the lists.	YES	NO
BILLOWS	It's either a word I heard or a word that's related to one of the lists.	YES	NO
FOOT	Not a word I heard, but it's related to one of the lists.	YES	NO

MUSIC	It's a word I heard on one of the lists.	YES	NO
SYMBOL	Not a word I heard, but it's related to one of the lists.	YES	NO
CLOUDS	It's either a word I heard or a word that's related to one of the lists.	YES	NO
HUSBAND	It's a word I heard on one of the lists.	YES	NO
GIRL	It's either a word I heard or a word that's related to one of the lists.	YES	NO
SCENT	Not a word I heard, but it's related to one of the lists.	YES	NO
BLAZE	Not a word I heard, but it's related to one of the lists.	YES	NO
DELAY	It's either a word I heard or a word that's related to one of the lists.	YES	NO
RAGE	It's a word I heard on one of the lists.	YES	NO

HATE	Not a word I heard, but it's related to one of the lists.	YES	NO
GOOD	It's either a word I heard or a word that's related to one of the lists.	YES	NO
PUFF	It's a word I heard on one of the lists.	YES	NO
HOUSE	Not a word I heard, but it's related to one of the lists.	YES	NO
HEALTH	It's a word I heard on one of the lists.	YES	NO
THIMBLE	It's either a word I heard or a word that's related to one of the lists.	YES	NO
WELL	It's either a word I heard or a word that's related to one of the lists.	YES	NO
FEMALE	Not a word I heard, but it's related to one of the lists.	YES	NO
SLEEP	It's a word I heard on one of the lists.	YES	NO

LAMP	Not a word I heard, but it's related to one of the lists.	YES	NO
FEAR	It's either a word I heard or a word that's related to one of the lists.	YES	NO
MELODY	It's a word I heard on one of the lists.	YES	NO
FOUNTAIN	It's either a word I heard or a word that's related to one of the lists.	YES	NO
UP	It's a word I heard on one of the lists.	YES	NO
DESIRE	Not a word I heard, but it's related to one of the lists.	YES	NO
DOLLS	It's a word I heard on one of the lists.	YES	NO
SLOW	Not a word I heard, but it's related to one of the lists.	YES	NO
HEAT	It's either a word I heard or a word that's related to one of the lists.	YES	NO

WHIFF	It's a word I heard on one of the lists.	YES	NO
AWAKE	Not a word I heard, but it's related to one of the lists.	YES	NO
MAN	It's either a word I heard or a word that's related to one of the lists.	YES	NO
WISH	Not a word I heard, but it's related to one of the lists.	YES	NO
PANE	It's either a word I heard or a word that's related to one of the lists.	YES	NO
SHADE	It's a word I heard on one of the lists.	YES	NO
HATRED	It's either a word I heard or a word that's related to one of the lists.	YES	NO
HEALTH	It's a word I heard on one of the lists.	YES	NO
WRITE	Not a word I heard, but it's related to one of the lists.	YES	NO

BLANKET	Not a word I heard, but it's related to one of the lists.	YES	NO
TIRED	It's either a word I heard or a word that's related to one of the lists.	YES	NO
PEN	It's a word I heard on one of the lists.	YES	NO
GLASS	Not a word I heard, but it's related to one of the lists.	YES	NO
SOUND	It's a word I heard on one of the lists.	YES	NO
NEEDLE	It's either a word I heard or a word that's related to one of the lists.	YES	NO
TABLE	It's either a word I heard or a word that's related to one of the lists.	YES	NO
HAPPINESS	Not a word I heard, but it's related to one of the lists.	YES	NO
FRIGID	It's a word I heard on one of the lists.	YES	NO

ANGER	It's either a word I heard or a word that's related to one of the lists.	YES	NO
STOP	It's a word I heard on one of the lists.	YES	NO
RING	Not a word I heard, but it's related to one of the lists.	YES	NO
SHUTTER	It's a word I heard on one of the lists.	YES	NO
SPIDER	Not a word I heard, but it's related to one of the lists.	YES	NO
WINTER	It's either a word I heard or a word that's related to one of the lists.	YES	NO
AROMA	Not a word I heard, but it's related to one of the lists.	YES	NO
UNCLE	It's either a word I heard or a word that's related to one of the lists.	YES	NO
INSECT	It's a word I heard on one of the lists.	YES	NO

SNOOZE	It's a word I heard on one of the lists.	YES	NO
TROUBLE	It's either a word I heard or a word that's related to one of the lists.	YES	NO
WARM	Not a word I heard, but it's related to one of the lists.	YES	NO
SHOOTER	Not a word I heard, but it's related to one of the lists.	YES	NO
DOCTOR	It's either a word I heard or a word that's related to one of the lists.	YES	NO
WORRY	It's a word I heard on one of the lists.	YES	NO
SEWING	It's a word I heard on one of the lists.	YES	NO
WRATH	Not a word I heard, but it's related to one of the lists.	YES	NO
BREATHE	It's either a word I heard or a word that's related to one of the lists.	YES	NO

PART 2

BUMPY	It's a word I heard on one of the lists.	YES	NO
JAIL	Not word I heard, but it's related to one of the lists.	YES	NO
DARK	It's either a word I heard or a word that's related to one of the lists.	YES	NO
MEASURING	Not a word I heard, but it's related to one of the lists.	YES	NO
JUNK	It's either a word I heard or a word that's related to one of the lists.	YES	NO
SOFT	It's a word I heard on one of the lists.	YES	NO
STATE	It's either a word I heard or a word that's related to one of the lists.	YES	NO
BEAUTIFUL	It's a word I heard on one of the lists.	YES	NO
LETTICE	Not a word I heard, but it's related to one of the lists.	YES	NO

TRASH	Not a word I heard, but it's related to one of the lists.	YES	NO
BOUNCE	It's either a word I heard or a word that's related to one of the lists.	YES	NO
TOUCH	It's a word I heard on one of the lists.	YES	NO
JONATHAN	It's either a word I heard or a word that's related to one of the lists.	YES	NO
TEA	It's a word I heard on one of the lists.	YES	NO
BLACK	Not a word I heard, but it's related to one of the lists.	YES	NO
BEER	It's a word I heard on one of the lists.	YES	NO
ROAD	Not a word I heard, but it's related to one of the lists.	YES	NO
GOVERNMENT	It's either a word I heard or a word that's related to one of the lists.	YES	NO

KITCHEN	It's either a word I heard or a word that's related to one of the lists.	YES	NO
COURSE	It's a word I heard on one of the lists.	YES	NO
CAN	Not a word I heard, but it's related to one of the lists.	YES	NO
PRETTY	It's a word I heard on one of the lists.	YES	NO
BUS	Not a word I heard, but it's related to one of the lists.	YES	NO
MISSISSIPPI	It's either a word I heard or a word that's related to one of the lists.	YES	NO
ROUGH	Not a word I heard, but it's related to one of the lists.	YES	NO
CABBAGE	It's either a word I heard or a word that's related to one of the lists.	YES	NO
PLUSH	It's a word I heard on one of the lists.	YES	NO

CUP	It's a word I heard on one of the lists.	YES	NO
CLIMB	It's either a word I heard or a word that's related to one of the lists.	YES	NO
BROOK	Not a word I heard, but it's related to one of the lists.	YES	NO
FLOOR	Not a word I heard, but it's related to one of the lists.	YES	NO
CHEESE	It's either a word I heard or a word that's related to one of the lists.	YES	NO
WASTE	It's a word I heard on one of the lists.	YES	NO
CAR	It's a word I heard on one of the lists.	YES	NO
LIGHT	Not a word I heard, but it's related to one of the lists.	YES	NO
CUSHION	It's either a word I heard or a word that's related to one of the lists.	YES	NO

SPRINGY	Not a word I heard, but it's related to one of the lists.	YES	NO
CHAIR	It's either a word I heard or a word that's related to one of the lists.	YES	NO
COURTS	It's a word I heard on one of the lists.	YES	NO
VEGETABLE	It's a word I heard on one of the lists.	YES	NO
CROWDED	Not a word I heard, but it's related to one of the lists.	YES	NO
CIRCUS	It's either a word I heard or a word that's related to one of the lists.	YES	NO
COFFEE	It's a word I heard on one of the lists.	YES	NO
COOK	It's either a word I heard or a word that's related to one of the lists.	YES	NO
CARPET	Not a word I heard, but it's related to one of the lists.	YES	NO

STOVE	It's a word I heard on one of the lists.	YES	NO
FELLOW	Not a word I heard, but it's related to one of the lists.	YES	NO
LEGS	It's either a word I heard or a word that's related to one of the lists.	YES	NO
TIE	It's a word I heard on one of the lists.	YES	NO
COTTAGE	It's either a word I heard or a word that's related to one of the lists.	YES	NO
VILLAGE	Not a word I heard, but it's related to one of the lists.	YES	NO
JUDGE	Not a word I heard, but it's related to one of the lists.	YES	NO
BIKE	It's either a word I heard or a word that's related to one of the lists.	YES	NO
SEAT	It's a word I heard on one of the lists.	YES	NO

SIT	Not a word I heard, but it's related to one of the lists.	YES	NO
SLOW	It's either a word I heard or a word that's related to one of the lists.	YES	NO
HEAT	It's a word I heard on one of the lists.	YES	NO
UNEVEN	Not a word I heard, but it's related to one of the lists.	YES	NO
FRUIT	It's a word I heard on one of the lists.	YES	NO
SWIM	It's either a word I heard or a word that's related to one of the lists.	YES	NO
ROBBER	It's either a word I heard or a word that's related to one of the lists.	YES	NO
DRUNK	Not a word I heard, but it's related to one of the lists.	YES	NO
MOUNTAIN	It's a word I heard on one of the lists.	YES	NO

LION	Not a word I heard, but it's related to one of the lists.	YES	NO
LAW	It's either a word I heard or a word that's related to one of the lists.	YES	NO
RUBBISH	It's a word I heard on one of the lists.	YES	NO
GIRLS	It's either a word I heard or a word that's related to one of the lists.	YES	NO
CROOK	It's a word I heard on one of the lists.	YES	NO
PIPE	Not a word I heard, but it's related to one of the lists.	YES	NO
CHARRED	It's a word I heard on one of the lists.	YES	NO
RIVER	Not a word I heard, but it's related to one of the lists.	YES	NO
LATEX	It's either a word I heard or a word that's related to one of the lists.	YES	NO

SOFA	It's a word I heard on one of the lists.	YES	NO
BURGLAR	Not a word I heard, but it's related to one of the lists.	YES	NO
LONG	It's either a word I heard or a word that's related to one of the lists.	YES	NO
THIEF	Not a word I heard, but it's related to one of the lists.	YES	NO
SEWAGE	It's either a word I heard or a word that's related to one of the lists.	YES	NO
FOOD	It's a word I heard on one of the lists.	YES	NO
METROPOLIS	It's either a word I heard or a word that's related to one of the lists.	YES	NO
SUMMIT	It's a word I heard on one of the lists.	YES	NO
TRAIN	Not a word I heard, but it's related to one of the lists.	YES	NO

STRAW	Not a word I heard, but it's related to one of the lists.	YES	NO
PILLOW	It's either a word I heard or a word that's related to one of the lists.	YES	NO
SHIRT	It's a word I heard on one of the lists.	YES	NO
VALLEY	Not a word I heard, but it's related to one of the lists.	YES	NO
STREAM	It's a word I heard on one of the lists.	YES	NO
JUSTICE	It's either a word I heard or a word that's related to one of the lists.	YES	NO
RED	It's either a word I heard or a word that's related to one of the lists.	YES	NO
CABIN	Not a word I heard, but it's related to one of the lists.	YES	NO
OVEN	It's a word I heard on one of the lists.	YES	NO

CITY	It's either a word I heard or a word that's related to one of the lists.	YES	NO
GLOVES	It's a word I heard on one of the lists.	YES	NO
FUR	Not a word I heard, but it's related to one of the lists.	YES	NO
JURY	It's a word I heard on one of the lists.	YES	NO
SWIFT	Not a word I heard, but it's related to one of the lists.	YES	NO
SAUCER	It's either a word I heard or a word that's related to one of the lists.	YES	NO
LAKE	Not a word I heard, but it's related to one of the lists.	YES	NO
ORANGE	It's either a word I heard or a word that's related to one of the lists.	YES	NO
JUNGLE	It's a word I heard on one of the lists.	YES	NO

GLACIER	It's a word I heard on one of the lists.	YES	NO
WHISKEY	It's either a word I heard or a word that's related to one of the lists.	YES	NO
TIRE	Not a word I heard, but it's related to one of the lists.	YES	NO
NARROW	Not a word I heard, but it's related to one of the lists.	YES	NO
RUBBER	It's either a word I heard or a word that's related to one of the lists.	YES	NO
SLEEVES	It's a word I heard on one of the lists.	YES	NO
CAPITAL	It's a word I heard on one of the lists.	YES	NO
RECLINER	Not a word I heard, but it's related to one of the lists.	YES	NO
TOUGH	It's either a word I heard or a word that's related to one of the lists.	YES	NO